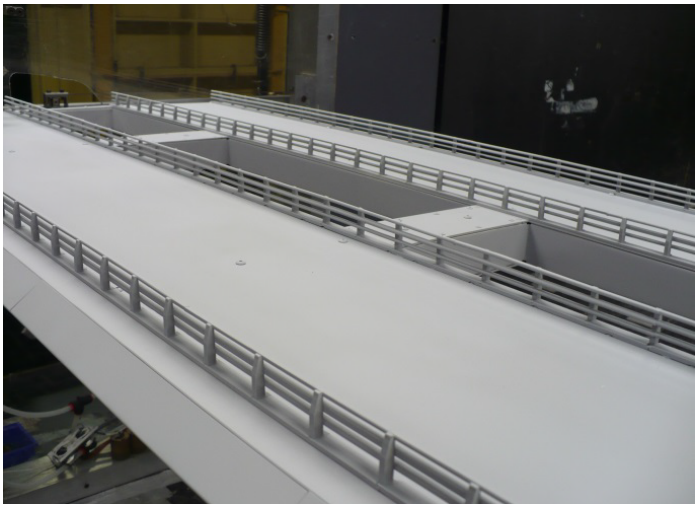
The Super Long Suspension Bridge, Korea

Wind Engineering Study



Owner: Korea University Research and Business Foundation	*Design: The Korea University and the Chonbuk National University of Korea*	*Year Tested: April 2013*
Super Long Suspension Bridge (Research Study)	*Main Span Deck Width: 33.4 m*	*Section Models: 1 to 50 scale*

The Project

The super long span suspension bridge research study is a collaboration research project among the Boundary Layer Wind Tunnel Laboratory of the University of Western Ontario, the Korea University and the Chonbuk National University of Korea.

The bridge deck configuration studied in the research program has a total deck width of 33.4 m with two traffic lanes in each direction. There is an 8.3 m wide opening between the roadways with 3 m wide crossboxes at 24 m center to center spacing connecting the two structural box sections. A triangular shaped fairing is located on the leading edges of the deck section. The deck section depth from the deck surface to the bottom of the deck is 3.1 m.

The main objective of the proposed research was to verify the aerodynamic performance of the proposed deck cross section for use in the design of Super Long Span Suspension Bridges.

The Wind Tunnel Studies

The primary concerns for long-span bridges for wind effects are a) aerodynamic instability due to “galloping” or “flutter” and b) buffeting responses of the structure due to turbulent wind.

The study was consisted of a 1 to 50 scale section model of the bridge deck section. Static section model tests were performed to obtain the static coefficients. Dynamic tests were performed in smooth flow to investigate the overall aerodynamic stability of the deck, and in grid-generated turbulent flow to define the buffeting response characteristics of the section. Aerodynamic derivative tests were also performed to study the motion related aerodynamic force parameters.

Two different edge fairings were used to assess their effect on the critical wind speeds for flutter in dynamic section model tests.

The Boundary Layer Wind Tunnel Laboratory

Western

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